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UNIMORE UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA — HuCog Human Cognition Lab

IS THERE AN AFFORDANCE EFFECT WITH TWO-HANDLED OBJECTS?

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INTRODUCTION

- The role attention plays in action planning is debated [1, 2].
- Previous research demonstrated that objects' action-relevant features (i.e., affordances, e.g. the orientation of a cup's handle) activate congruent motor responses even when actual interactions with the object are not required [1-5].
- Such correspondence effect, also known as the "affordance effect", has so far been studied with one-handled objects, that is, objects that present a graspable handle on one side only, and, hence, can be grasped with one hand.
- The aim of the present study is to investigate whether graspable objects that are usually grasped by two hands (i.e. two-handled objects; e.g. shears) show similar effects.

METHOD

Thirty-eight participants were asked to categorize 8 two-handled objects as being mainly used during spare time for amusement purposes or in the kitchen for cooking purposes. Each object could appear on the display either alone or as grasped by one hand/two hands. When the object was grasped by one hand, the hand could be spatially compatible (on the same side) or incompatible (on the opposite side) with the response key (see Figure 1 below for details).

The experiment has a within-participants factor with four levels (*Condition*: Object Alone, Compatible Grasping, Incompatible Grasping, Two-Handed Grasping). Response Times (RTs) and Percentages of Errors (ERs) are the key dependent variables.

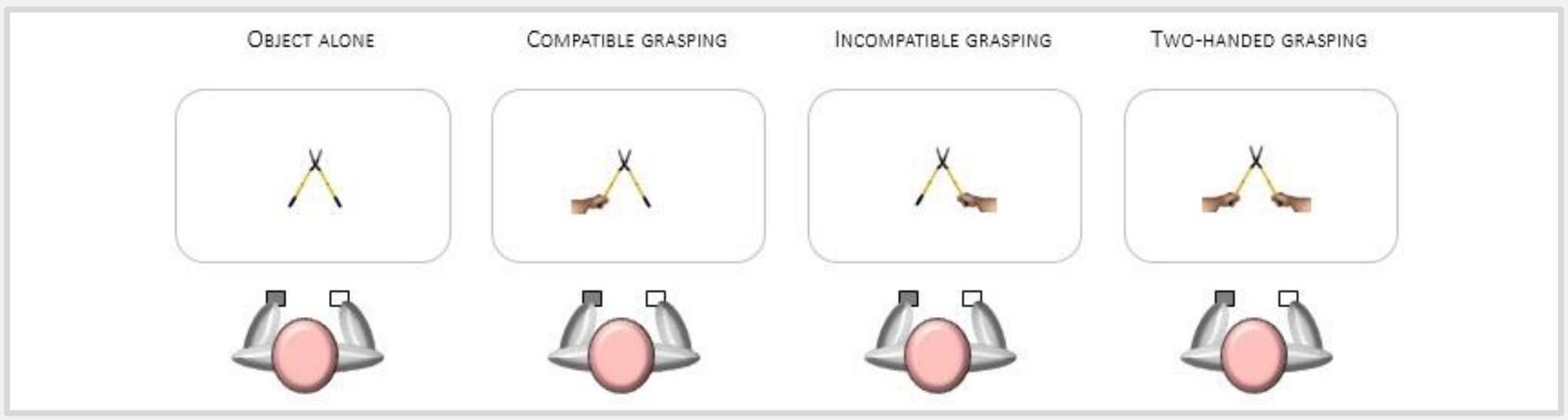

Figure 1: Illustration of the 4 experimental conditions.

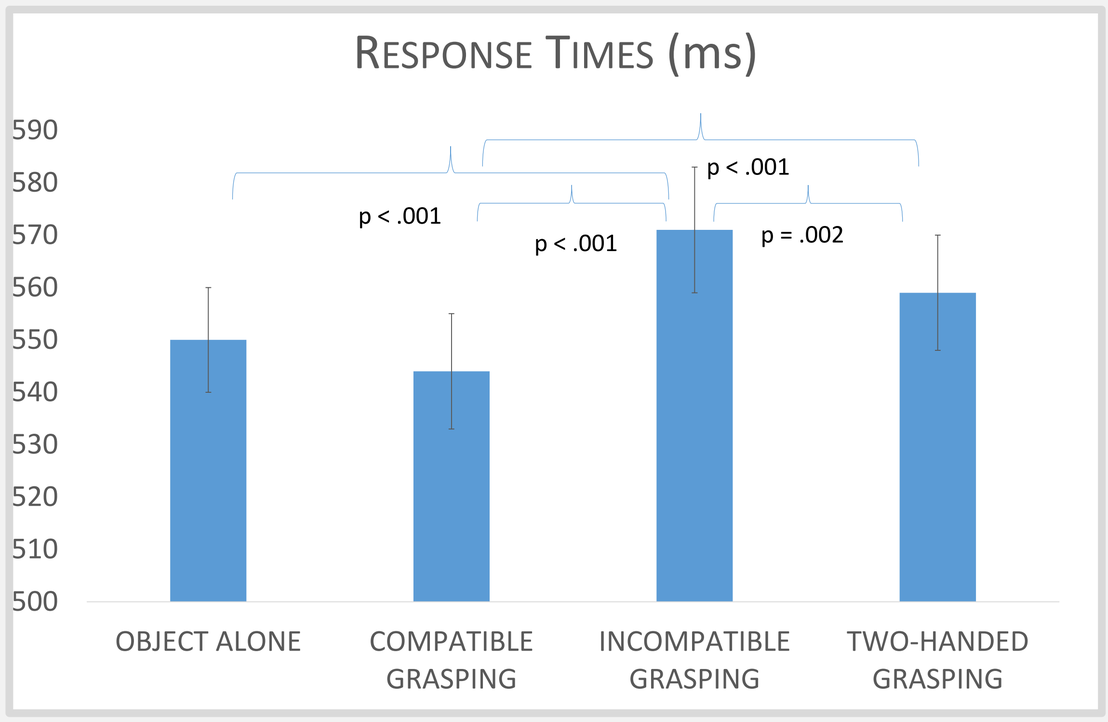

Figure 2: Mean Response Times (in Milliseconds) as a Function of *Condition* (Object Alone, Compatible Grasping, Incompatible Grasping, Two-Handed Grasping). Bars are standard Errors.

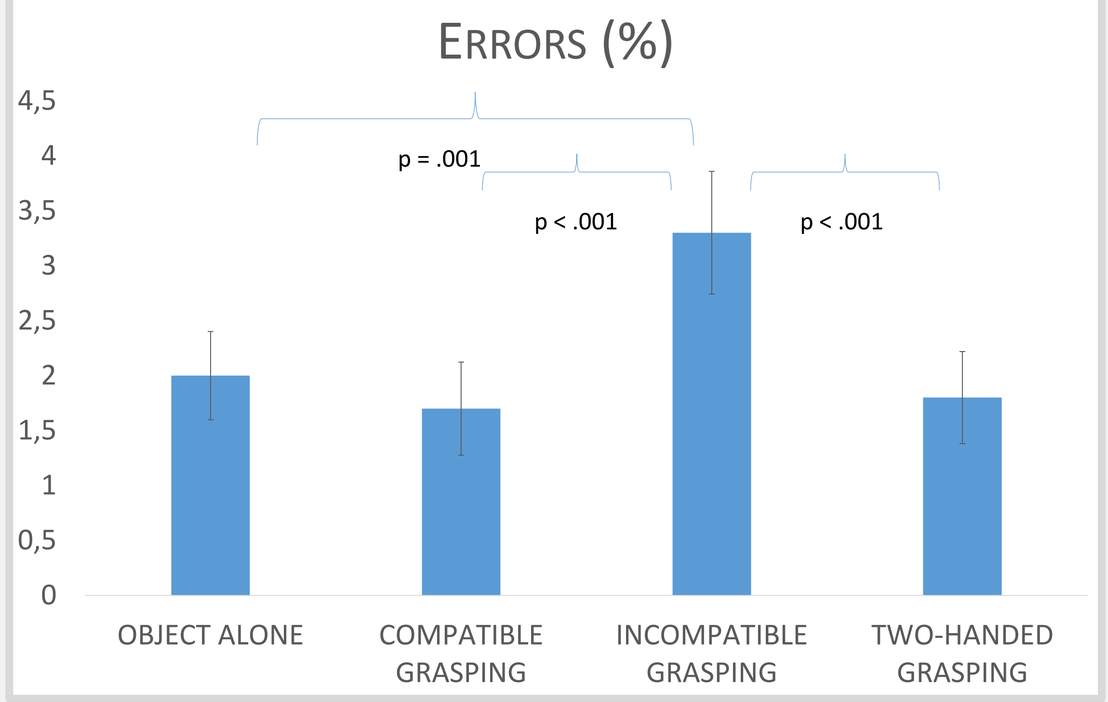

Figure 3: Percentages of Errors as a Function of *Condition* (Object Alone, Compatible Grasping, Incompatible Grasping, Two-Handed Grasping). Bars are standard Errors.

RESULTS & DISCUSSION

- A Repeated Analysis of Variance (ANOVA) with *Condition* as the within-subject factor was performed on both RTs and ERs. The main effect of *Condition* was significant for both dependent variables [$F(3, 102) = 23.070$, $MS_e = 469.767$, $p < .001$, $\eta_p^2 = .404$] [$F(3, 102) = 12.616$, $MS_e = 5.757$, $p < .001$, $\eta_p^2 = .271$].
- Bonferroni-corrected planned comparisons showed better performances for the Compatible Grasping compared to the Incompatible Grasping condition indicating a facilitation for the processing of two-handled objects when they appeared as grasped on the same side as the response. See Figures 2 and 3 for details.
- Interestingly, the Compatible Grasping condition did not significantly differ from the Object Alone condition (see Figures 2 and 3) suggesting that perception of affordances was triggered by the object itself rather than the grasping hand(s) [1, 2].
- Further research is needed to strengthen evidence supporting an affordance account of correspondence effects with two-handled objects.

TIP

Does it make a difference whether the grasping hands are perceived as others' rather than as our own?

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